ADAPTABLE HOUSING:
ACCOMMODATING CHANGE

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PHD 2016
Abstract

My work, published essays and books listed below, provides new insights into architects’ approaches to housing design since the beginning of the twentieth century. Drawing on methods from both history and practice the work uses primarily drawn building studies familiar in professional journals for comparative analysis. Two interrelated issues, housing designed to be adaptable (or flexible) and housing designed for families other than the norm of the static, nuclear family, characterise the approach to the work implicit through the selection of case studies. A reflective essay considers the work in the context of attempts to introduce flexible housing typologies and the potential impact on the role of the architect and the consumer. Further context is provided in an appendix setting out an annotated chronology of relevant legislation, reports and recommendations, to raise questions about its complexities and the contemporary renewed focus on minimum space standards as the primary tool to improve housing quality.
Work presented in the submission

**Principle publications and texts**

*Key Urban Housing of the Twentieth Century: Plans Sections and Elevations.* Laurence King (UK) and Norton (USA) 2008. 240pp Translations for Italy, Spain, France and Brazil 2010 and China 2013 (Author)

*New Urban Housing* Laurence King (UK) and Yale (USA), 2006 Editoriali Gili SA (Spain) and Logos (Italy) 192pp. Second edition in paperback 2009 (Author)

*Accommodating Change: Innovation in Housing Design*, The Architecture Foundation and Circle 33 Housing Group, 2002 (Editor)


*Patterns of Living: Hong Kong’s High-Rise Communities*, 201pp VTC Press, Hong Kong 2013 (joint author)

**Supplementary publications and texts**

Housing projects for 20th-Century World Architecture: The Phaidon Atlas, 2012 (Contributor)


*Architecture begins and ends in pictures*. Spaces of History / Histories of Space, Berkeley, California 2010 (conference paper)

*A Room of One’s Own* for the Architecture Foundation, 2001 (Short essay)

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Author’s declaration

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree.

Signed: ________________________________

Dated: ________________________________
Reflections on the submitted works

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SECTION ONE Introduction

“It is thus not to be wondered at that the adaptable house - the house which could easily be altered as circumstances change - is a recurring theme in the evidence we received and in our own thoughts.”¹

At the time of writing this essay, more than half a century after the Parker Morris Report, the RIBA has just published (December 2015) a report on the size of houses in Britain.² Entitled Homewise: Space Standards for Homes it compares the average, overall size in square metres of the typical three-bedroom five-person house in each of 100 randomly selected schemes built since 2012. Compared with the current recommended minimum size of 93m², despite some regional variations, the overall average falls short. The Nationally Described Space Standard came into force in October 2015 but, as it remains voluntary for Local Authorities, the report acknowledges that due to excessive and costly bureaucracy it is unlikely to be implemented. The RIBA is therefore calling on Government to embed the Standard in Building Regulations.

Implicit in my research work is a questioning of whether reliance on space standards alone could ever result in better quality homes or increased provision. Minimum space standards are seen as crucial in maintaining quality by their supporters; by their detractors they are seen variously as either hampering the imagination of designers or unnecessarily increasing construction costs for commercial developers, who can happily build smaller. The new space standards are little changed from earlier versions. There is no mention of flexibility – the adaptable house – mentioned in the Parker Morris report, and there are no recommendations on variation. A requirement for flexibility, sufficient to provide for changing family requirements would almost certainly lead to bigger spaces by default and if a family can stay longer in the same home, this could be seen as an advantage.

¹ Homes for Today and Tomorrow, Para 28 p.9
² See Appendix 1 for chronology of related legislation, reports and recommendations
The terms ‘adaptability’ or ‘flexibility’ are commonly used interchangeably and there is some overlap in their definitions. Whilst ‘flexibility’ is used here to encompass adaptability, if a distinction is appropriate Stephen Groák’s is perhaps the most useful. Flexibility, means a home is “capable of different physical arrangements” or can be altered and adaptability refers to the way a home is inhabited, that is, “it is capable of different social uses”\(^3\) to accommodate a growing or changing family.

Flexibility is further defined in several different ways. At the largest scale, based on structural configuration, it might mean a property owner can gut a building and reconfigure it without altering the structure and services. At its simplest it can mean being able to rearrange furniture. Both terms are more easily understood by their opposite - a ‘tight fit functionalism’ – that sees all rooms ascribed a single purpose with little option for other use, a phrase attributed to Andrew Rabeneck.\(^4\) Rabeneck categorised the approach of housing architects into two opposing camps. On one hand are those he termed the ‘popular mechanics’ those who accepted the status quo and used their skill to find ingenious ways to achieve as much as possible within the (small) space standards laid down. (In this category he included the Rogers and the Smithsons). The others he described as ‘new society’, those who were not prepared to accept the imposed space standards and conventional layouts but looked for alternatives. At the time of writing, improving the speed of production of housing was the main agenda and his critique is focused on how their ideas might be realised using pre-fabrication, or other mechanised methods.

Since the 1970s, for volume house builders, tight fit functionalism has remained the norm and there has been very little publication surrounding any discussion of flexibility until recently, with the publication of Schneider and Till’s book *Flexible Housing* in 2007.\(^5\) For many architects however, with interest beyond the developers’ commercial

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\(^3\) Groak, S. p.15
\(^4\) Rabeneck, A. AD Vol 43 No 11 1973 Nov pp.716-727
\(^5\) Schneider, T., and Till, J. “As the first comprehensive overview of this important subject, the book examines the past, present and future of flexible housing, collecting together over 160 international examples of the genre as a major point of reference. Combining history, theory and design, the book makes the case for flexible housing and also shows the various ways by which it has been and can be achieved.” Cover
considerations, it has often been a key driver in their approach to housing design. The difficulty in looking for ways to include flexibility or adaptability, and moreover to accept that there may be some desired contribution to the designs by the residents, is summed up by Peter Smithson in a lecture published in 1971

“The Ideal house is that which one can make one’s own without altering anything. Make one’s own in the usual way, that is within the limits of the fashion of the time .......The search for a style that can match this ideal had been the floating centre of our effort....”

Flexibility raises questions about how decisions are made about how people live but also raises questions about the role of the architect in making those decisions. Whilst for residents flexibility is seen as a positive aspect of housing, allowing them some means of control, of self-expression or what might colloquially be called ‘ownership’ of their living space, it can be seen in a negative light for architects. Designing housing that can be interfered with or that invites alteration in the future, suggests that the design is inadequate and less than the perfect solution to the problem. It means that architects could be seen as relinquishing their usual position of overall control.

**My projects and publications**

The works presented in this submission draw on both theory and practice, using my knowledge and experience of architectural practice and history, of interest to both practitioners and historians. These works are the significant elements of a body of work that includes other works on the same topic prepared for conference presentations, reviews, and contributions to other publications. The focus for my work is housing provision in England from the late 19th century onwards but it also draws on examples of Western architecture from Europe and further afield where these contribute to the discussion. Beyond the complexities of the socio-economic and political context, it focuses on matters of design, aligning historical examples with contemporary projects which all share the unchanging brief, to create a place to live.

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6 Smithson, Alison and Peter, p.126
The starting point was an essay assignment as part of my History of Modern Architecture Master’s course at the Bartlett (1994), entitled Gender and Cities, an exploration of the urban environment and housing design, based on the work of the material feminists discussed in Dolores Hayden’s work. I explored this topic further through teaching history and theory courses for undergraduate students of architecture, and through an extended essay entitled Living Together published in Impossible Worlds: the Architecture of Perfection, (2001). This essay raised questions about why collective housing projects have enjoyed only limited success and whether “the low density, out-dated ‘family’ house that has already devoured so many acres of greenfield sites is sustainable? I continued to explore non-standard or innovative forms of housing design through design studio teaching initially and then through research work seeking out built examples of alternative housing designs to the pervasive norms of England’s volume house builders, which formed the basis for several projects and books.

The first was a significant project organised by the Architecture Foundation (AF) in collaboration with Circle 33 Housing Association. Circle 33 was planning to build a new housing scheme on a site it had in Bow, London and, rather than rely on their known designs, had agreed with the AF to explore alternative models through a design competition. Entitled Accommodating Change; Innovation in Housing, the competition set out to explore how we might deal with not only increased density, a major preoccupation at the time, but also changing demographics and alternatives to a functional approach through flexibility and shared spaces. The project included a parallel student ideas competition and a series of seminars to discuss ongoing housing design issues and, at the conclusion, an exhibition at the AF Gallery in St James’s and an accompanying publication. I was appointed initially as a consultant to the project

7 Impossible Worlds: The Architecture of Perfection. “This book explores the ways in which real buildings have resulted from visionary ideas, and assesses the extent to which these have changed the way people live. In three sections the editors have arranged key texts together with a selection of projects which illustrate the ideas, and the built realities which followed on from them. In the first part, Hilary French explores the development of communitarian ideas, and the ways in which utopian thinking has generated new ideas for housing.” Cover p.41
8 French, H Living Together p.41
9 Circle Housing. Circle 33 began life as a traditional housing association in 1968. In 2005 it merged with the Anglia Housing Group, and is now the largest partner subsidiary of Circle Housing (formerly Circle Anglia), owning 17,100 homes across London and in 48 Local Authority areas http://www.circlegroup.org.uk/our-group/social-housing/Circle_Housing_Circle_33
contributing to devising the brief, which was seen as a tool for starting the debate in addition to setting out the programme and site description. As a result of the competition’s huge success, attracting around 140 entries, I was then invited to curate an exhibition at the AF Gallery and produce and edit an accompanying publication. The winning project, by Peter Barber Architects, was completed largely to the competition design in 2006.

Following the success of *Accommodating Change* I was invited to contribute a short essay to the catalogue for an RIBA exhibition, *Coming Homes* (2003) and then to carry out a further project funded by the AF, *Home: Design and Desirability* (2004) the results of which were exhibited, in video format, at 100% Design. Whilst not major projects, both explored the notion of flexible space and both revealed the difficulties associated with survey work in relation to public perception of housing design and obtaining data about how we live. My later publications, *New Urban Housing* (2006) and *Key Urban Housing of the Twentieth Century* (2009), focus on innovative

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10 French, H. Ed *Accommodating Change: Innovation in Housing* 2002 Housing design is central to the debate on the future development of cities with pressure to provide more, both cheaply and quickly. This time it is to accommodate an increasing population and changing demographics. The Accommodating Change initiative grew out of Circle 33 Housing Group’s desire to promote interest in and thereby, improve the quality of affordable housing. In collaboration with the Architecture Foundation, they held two competitions, for architects and for students, a series of workshops and seminars focusing on different housing related issues. This publication accompanied the Architecture Foundation’s exhibition for Circle 33 Housing Group from 22nd February to 27th March 2002, and includes illustrations of selected competition entries and essay contributions from architects and academics. [http://shop.architecturefoundation.org.uk/products/accommodating-change-innovation-in-housing](http://shop.architecturefoundation.org.uk/products/accommodating-change-innovation-in-housing)

11 The press reaction to Donnybrook has been overwhelmingly favourable, as can be seen by this following sample of quotes:

‘Barber has just completed the most innovative piece of large-scale housing built in Britain for years.’ [Dyckhoff, Tom. *Times*, 24 January 2006]  
‘Donnybrook is a complex, socially challenging architectural arrangement. The rationalism used in Bow is about inclusion, physical agreement and the startling realities of progressive urban change.’ [Merrick, Jay Independent, 25 January 2006]  
‘Top dogs for 2006, best buildings in class. Housing: Donnybrook ... Peter Barber Architects is ... best placed to make a really significant impact on a sector that for many years has fought shy of innovative design.’ [Woodman, Ellis. *Building Design*, 6 January 2006]  
This inspiring scheme ... strives to repair some of the rips that have been made in London’s fabric since the Second World War. If you can achieve all that with this level of elegance, you could well be on to something.’ [Rose, Steve. *Guardian*, 6 February 2006]. In addition to its press reviews, the Donnybrook Quarter scheme was also included as an exemplary new project for the capital’s built fabric as part of the New London Architecture Exhibition in mid-2005. [http://westminsterresearch.wmin.ac.uk/4823/1/Barber_3.pdf](http://westminsterresearch.wmin.ac.uk/4823/1/Barber_3.pdf)

12 French, H. *The Simple Life Based on responses to a MORI poll on popular housing types in 7000 Words on Housing.* “A series of essays on housing and ideas of home in the UK today. Leading architectural historians, writers, researchers and architects, explore issues such as planning, taste, house prices, the measurement of value in design and the typologies and models of suburbia.”

13 This project explored the potential for user research with reference to the definition of briefs used by architects and social landlords to compare design intentions with users’ experience. This project moved away from the more pragmatic issues, to investigate the less tangible aspects of desire - something that is more usually associated with the wealthier world of private housing developments. A series of case studies of recently completed housing projects in the London area were identified covering a range of different housing types, elderly, key worker, sheltered housing, etc. Questionnaires were devised to elicit the key aspects of living in that particular building project and to extrapolate information that might be useful for other briefs and other projects.
approaches to design, or new thinking implicit in the building studies selected for inclusion. The most recent project, which is documented in the book *Patterns of Living: Hong Kong’s High Rise Communities* (2013) was the result of an invitation to contribute to the newly established Research Centre at the Hong Kong Design Institute. Through their participatory agenda it offered me an opportunity to explore the interiors of the social housing units built by the Hong Kong Housing Authority, which mostly comprise indeterminate spaces, bringing together both my main research strands, flexibility and patterns of occupation.14

To continue this work, revisiting exemplar housing projects to explore the relationship between the design ideas of the architects and the ways in which the residents have occupied their homes over time could usefully inform future practice. However the logistics of such a study and gaining access to private homes make it an unlikely proposition. *Accommodating Change: Innovation in Housing*, documented what had been an inspirational project for many and provided lasting record of what is still considered an important project. Finding more ways to encourage house builders to offer the chance to young practitioners to explore new ideas and build more experimental housing projects, rather than relying on their tried and tested typologies, might offer more sustainable adaptable models

The publication of Schneider and Till’s book, Flexible Housing, supported by funds from the AHRC, might suggest that ideas of adaptability are part of the mainstream. However, recent legislation suggests that the more easily quantifiable, space standards, are still the focus for current debate on how to improve housing quality

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14 *Patterns of Living*. I was commissioned to contribute to a project coordinated by Dr. Lee at Hong Kong Design Institute, a unique opportunity to gain access to the standard ‘social housing’ units designed by architects and occupied by ordinary families. Inspired by European modernism, the Hong Kong Housing Authority (HKHA) has pioneered land reclamation and high-rise construction since the mid-1950s, producing some of the world’s densest, most vertical residential areas. Data was collected and analysed from 120 typical homes to discover how families occupy the compact flats that have continued to be developed, maintained and rented by the HKHA. The research shows for the first time the interiors – the lived reality of modernism’s housing project – and has highlighted a particular flat type that housing studies now categorise as ‘indeterminate’: it is offered to tenants as a shell to partition and arrange themselves. Its success offers a model with international significance, controversial especially in rental housing, but with the potential to reduce housing costs and potentially a way forward in allowing future flexibility.
My work, has provided insight into the changing approach to housing design, in the broadest sense, from the early twentieth century when the apartment block was established as a new building type through to the latest built projects – with an implicit focus on adaptability. In order to focus on design layouts, well-known historical examples are presented alongside contemporary projects, using the same style for comparative purpose. Rather than the ‘how-to’ manuals favoured by some authors my work uses primarily visual analysis, using standard drawing technique, the common language of architecture, to provide analogous reference.

**My background**

Before taking up a role as a full-time academic in 1998, and embarking on research work alongside teaching and school management duties, I had a varied career in architectural practice. I worked for architects in private practice on a wide range of building types, mostly public sector projects, and for Interior Designers for a short time generally on retail design projects. My own practice focused mainly on works to listed buildings for private and government clients. During my time in practice I learnt something of the legislative frameworks and working methods as part of a number of design teams, on new housing projects in Milton Keynes, Warrington New Town and rue Fontarabie in Paris amongst others, as well as major terraced housing refurbishment and rehabilitation projects in London.

My recent academic role at the RCA, as Head of the School of Architecture & Design with responsibility for the Design Products Department, meant working closely with industrial designers, notably Ron Arad and Tord Boontje. In broad terms, this wider context for considering architectural production influenced my thinking and raised questions for me about the nature of housing design – notably about where it might sit between architecture and industrial design and perceptions of the relative status of the architect and the designer. With its repetitive nature, suitability for pre-fabrication and volume production, the design of housing has been thought to have more in common with the production of other consumer products very different to architecture’s bespoke ‘iconic’ masterpieces.
Background and Context

Prototypes and models

Working alongside Industrial Designers, I was introduced to their different working methods and particularly their extensive use of full-size models. Unlike the scale models regularly used by architects, the full-size models and prototypes can be used by designers to assess the look and feel or functioning of an object, and by the manufacturer to assess tooling and materials. I had witnessed some limited use of full-size mock-ups in architectural practice, in Paris in the early 1980s; one of the Pyramid in the Louvre courtyard (I. M Pei 1989), the other part of new structures in the Parc de la Villette (Reichen et Robert 1984). Both were, however, little more than loosely constructed three-dimensional outlines, to assist the architects and clients in their evaluation of the visual impact of the new forms on surrounding heritage buildings. Some experimental or avant garde design projects are considered prototypes by default, e.g. BedZed\textsuperscript{15} or Passivhaus,\textsuperscript{16} which have provided models for energy efficiency. The Innovation Park at the Building Research Establishment (BRE) also has a series of full size houses, built to demonstrate construction and energy efficiency.\textsuperscript{17} The BRE has in the past extended the use of their ‘test’ houses for domestic science purposes but it is extremely rare to find prototypes for housing which focus on more general design issues – space, access arrangements and plan organisation. We see ‘show homes’ regularly at development sites and those that appear annually at the Ideal Home Show but these are aimed at encouraging purchasers rather than architects interested in exploring demonstration of new kinds of architectural thinking.

Various moments in the history of housing, when circumstances of funding and political will have come together, have led to such housing ‘prototypes’ built as exhibitions which, partly due to their rarity (or their permanences or persistence), are

\textsuperscript{15} “BedZED is the UK’s first large-scale, mixed use sustainable community with 100 homes, office space, a college and community facilities. Completed in 2002, this pioneering eco-village in south London suburbia remains an inspiration for sustainable neighbourhoods.” http://www.bioregional.com/bedzed/

\textsuperscript{16} “The Passivhaus standard was developed in Germany in the early 1990s by Professors Bo Adamson of Sweden and Wolfgang Feist of Germany and the first dwellings to be completed to the Passivhaus Standard were constructed in Darmstadt in 1991.” http://www.passivhaus.org.uk

\textsuperscript{17} “The role of the Innovation Parks is to inform the industry and policy makers on the viability of construction innovations that can deliver improved performance and true sustainability within the built environment.” http://ipark.bre.co.uk
credited with considerable significance and regularly included in histories of housing. Histories regularly cite the early examples of the new model for urban flat dwellings constructed for the 1851 Exhibition in London’s Hyde Park, subsequently relocated to Kennington Park, and the much later, 1905 and 1907 Letchworth Cheap Cottages exhibitions demonstrating the alternative, ‘rural’ option. Other key exhibitions include the Weissenhof Seidlung opened in 1927, the first to demonstrate the ideas of the modern movement architects, followed by the Vienna Werkbund exhibition of 1932. More recent examples are the Berlin IBA exhibitions, the first in 1957 which continued the modernist approach and then the less well known, in 1984, which saw a ‘post modern’ return to the traditional city block, which the director Josef Paul Kleihues saw as analogous with ‘the pace of life and rhythm of urban space.’ The most recent European model is the Housing Festival in the Hague built between 1987 and 2003. Intended to exhibit the broadest range of housing types, it demonstrates low, medium and high-rise typologies along one linear site.

Architecture Books

With few such exhibitions offering an opportunity to explore the physical materiality and experiential quality as well as the architectural thinking of actual built examples,

18 “The final room of the Exhibition Model Dwellings met that desire on a reduced scale. This room contained two types of publications: pamphlets and books documenting the current state of housing of the poor, and pamphlets and books documenting model dwellings designed to address and improve the dire conditions documented in the first category. There were also displays of architectural plans for the model dwellings through which the visitor had just walked as well as other model dwellings the society had built elsewhere. In other words, books like Robert’s The Model Houses for Families: Built in Conjunction with the Great Exhibition of 1851 by Command of this Royal Highness, the Prince Albert, K.G., displayed in the final room, translated into print from the house through which the visitor had just toured.” http://www.branchcollective.org/?ps_articles=barbara-leckie-prince-alberts-exhibition-model-dwellings

19 The Letchworth Cheap Cottages exhibitions in 1903 and 1907 sponsored by the Daily Mail led to the Ideal Home Exhibition (now the Ideal Home Show) which continued to show model homes. Referred to in the introduction to French, H. New Urban Housing

“...It is not so much a model village as a village of model cottages; and not only cottages which are models in the sense of being airy, sanitary, and fitted with modern appliances, but models also in the sense of being examples, to be seen and handled, of what can be built in this or that material to cost this or that sum of money. Here, above all, the by-laws, although they rightly insist on proper sanitation, do nothing to strangle invention, or to choke enterprise in discovering new methods and new materials; so that it is possible, instead of merely reading about what can be done in framing cheap walls and foundations and partitions, actually to walk in and out of cottages made of iron and wood, cement, expanded metal, concrete, artificial stone, steel and plaster, and all the hundred-and-one combinations and variations of material hitherto forbidden in the great majority of rural districts. “A hundred-and-one variations,”—it is hardly an exaggeration, for standing in the Exhibition grounds at Letchworth are actually a hundred cottages, fifty of them finished already, fifty more being rapidly pushed towards completion.” http://archive.spectator.co.uk/article/22nd-july-1905/8/the-cheap-cottages-exhibition

20 Kleihues, IBA Catalogue 1984 quoted in French, H. Key Urban Housing p 159

21 French, H Key Urban Housing p193 and 196-97

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architects rely heavily on the next best thing, building reviews, which include extensive
drawn analyses together with textual description or critique. Such building studies
found in professional journals form the basis of what are now commonly referred to as
‘picture books’ a term coined by F. R. S. Yorke in the introduction to Modern Flats
(1958), to describe books aimed at an architectural audience, the informed
practitioner.

‘Picture books’, distinct from theory or technical reference books, share roots with
architects’ folios originally made for clients. According to Peter Eisenman, books which
combine drawings with text have “become part of an architectural tradition.”
Starting from the great architectural treatises, citing precedents of Vitruvius and
Alberti through Serlio and Palladio to Scamozzi and Lodoli, such ‘books’ included
reflections on their built works as well as designs and speculations on future works
through both text and drawings. This phenomenon, the interrelationship between
text and drawings is also discussed by Alan Powers in his essay entitled The
Architectural Book. Such ‘picture books’ were of course used by architects for
promotional purposes, and continue to be so, to show potential clients their work.
Beyond their use as a marketing tool and unlike a ‘text’ book they offer a hybrid way to
convey information, not necessarily in consecutive order, a linear format but one that
can accommodate other routes through the information contained.

It is important to make a distinction between what are referred to here as ‘picture
books’ and the 18th and 19th century ‘pattern books’ that were used by builders at a
time when architects became less and less involved in the housing field. Their terraced
houses which typify most English towns and cities, are rarely credited to any
admits to a lack of any detailed research into the designers of terraced housing but
claims that in any case such research would be futile. Other than perhaps some
elevations or site plans drawn up by architects, builders took overall responsibility.

22 Eisenman, P., preface
24 See Rattenbury, K Ed. this is not architecture
25 Muthesius, S p.251
This separation between architects and builders was to increase as architects moved towards professionalisation (achieved in the UK in 1934) and builders consolidated an entrepreneurial role. Pattern books therefore, regularly copied by builders, played an increasingly useful role, along with the ‘how to’ books of various different building construction trades until the beginning of the 20th century when they were gradually replaced by catalogues produced by manufacturers and suppliers.

In housing, compared to other building types, the ‘picture book’ is more common. It is not the promotional ‘portfolio’, nor a pattern book, nor a catalogue of ‘off the shelf’ types to be copied but has developed as a hybrid. Like the building reviews of professional journals, it uses drawn and textual analysis providing analogous models for a professional audience.

Two of housing’s best-known ‘picture books’ are the seminal works by F R S Yorke (1906-62) and Frederick Gibberd (1908-84) The Modern Flat (1937) and Modern Flats (1958) published by the Architectural Press. They were intended to encourage architects to engage with housing design, and more specifically the design of what was at that time a new building type – blocks of flats. The Modern Flat is focused on projects that had been built since 1927, with examples grouped by country. Symptomatic of the first generation of Modern Movement architects, the introductory essay reinforces the authors’ advocacy of higher density urban development, and particularly flats claiming that “the flat has produced a building type peculiar to our own era: without precedent in the architecture of the past.”26 New industrialised fabrication systems rather than traditional building methods, a key aspect of ‘modern architecture’, was further encouragement for architects to become involved with the provision of housing and “above all seeing architecture as a key element in the drive to provide people with better-quality housing and a better way of living.”27 The main content of the book is the series of building studies, with photographs and short text about each project. An introductory chapter provides advice on planning which includes kitchen design clearly based on Margarete Schütte Lihotsky’s Frankfurt

26 Yorke, F R S and Gibberd, F The Modern Flat p.6
27 French, H Key Urban Housing p.12
Kitchen (1926) and bathrooms with minimum exposed pipework illustrated with Lubetkin’s Highpoint (1935).

By 1958 when the same authors published a second volume, this time with projects built since the end of the war in 1945 they had decided that any commentary was superfluous. They considered that their decisions on which projects to include were adequately influential without the need for any additional critical commentary to further contextualise, explain or substantiate their choices, calling it simply “a picture book in which are recorded …… some of the more distinguished flat buildings which have been built in recent years.”

Roger Sherwood’s Modern Housing Prototypes published in 1978 covers the period from 1903 and the rue Franklin Apartments, Paris by August Perret up until Neave Brown’s Fleet Road Housing, London designed in 1967. Although an American publication, it focuses largely on the best-known European examples of modernism’s legacy. The plan and section drawings of 32 case studies are mostly simply photographically reproduced in black and white while a series of specially made, colour coded, cutaway axonometric projections are used for comparison. Axonometric (or isometric) projections, “Bypassed now by the ability of the computer to twist, turn re present and re present”

The Floor Plan Manual published in 1994, starts with the Unité d’Habitation in Marseilles (designed in 1947), includes a few regularly cited examples from the 1950s and 60s then focuses mainly on projects built in the 20 year period from 1975 onwards mainly in Northern Europe. A very ambitious and informative publication, it includes data and text in German and English, as well as presenting all the drawings to a

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28 Yorke, FRS and Gibberd, F Modern Flats p.7
29 Cook, P p.99
uniform scale. However, in the same way as Sherwood’s book, it mostly reproduces original, often construction drawings with a high level of detail at much reduced size, resulting in poor legibility and considerable unevenness (Figs. 1, 2 & 3). Formats for Living Contemporary floor plans in Amsterdam,\textsuperscript{30} takes a novel approach to the genre. Six experts were invited to curate a collection of recently built residential buildings, showing only the series of plans, following a short introductory commentary. The plans are presented with no annotation other than the name of the architect, the (street) name of the project and whether market sector or subsidised. It is frustrating not to see the building plan or site plan which was perhaps presumed unnecessary for those familiar with Amsterdam and its housing but the presentation of the plans in a very small format book, drawn in the same style to the same scale, focuses attention on the particular issues of internal layout.

Three recent publications which are not strictly ‘picture books’ have made useful contribution to the subject of flexibility. The most comprehensive is Flexible Housing by Tatiana Schneider and Jeremy Till published in 2007 by the Architectural Press. It provides an historical analysis of flexible housing, and makes a strong case for its support. Based on Groák’s definitions (see p. 10) the term flexibility is used to include adaptability.\textsuperscript{31} A chronologically presented selection of examples provides a comprehensive referenced list of projects and - the most important projects\textsuperscript{32} - are developed further in a series of 84 case studies carefully drawn for consistency of presentation to the same scale, in plan (1:200). Approximately half of the case studies are of apartment buildings or urban blocks with many unbuilt projects or studies included as well as detached and semi-detached houses.

Total Housing; alternatives to urban sprawl (2010), includes only basic data, randomly scaled drawings and captioned photographs of 61 projects built in the first decade of

\textsuperscript{30} Kloos, M and Wendt, D (Eds) “The uniform method of drawing has resulted in a lucid collection of plans, which for all their apparent simplicity contain an encrypted code – a format for living.” Cover

\textsuperscript{31} Schneider, T and Till, J p 4 “Our broad definition of flexible housing is housing that can adjust to changing needs and patterns, both social and technological. These changing needs may be personal (say an expanding family), practical (i.e. the onset of old age) or technological (i.e. the updating of old services). The changing patterns might be demographic (say the rise of the single person household), economic (i.e. the rise of the rental market) or environmental (i.e. the need to update housing to respond to climate change)”

\textsuperscript{32} Ibid p 203
the twenty first century. Organized unconventionally, according to the total numbers of units that range from four to 750 the significance of each project is not always evident. To define the qualities of the projects, it relies on a series of 13 ‘keywords’\textsuperscript{33}, four of which are grouped under the heading ‘Flexibility’.\textsuperscript{34} The first of these ‘adaptability’ is defined as above, ‘openness’ relates to indeterminate space and the third is ‘spaciousness’ or simply space. The fourth, ‘unit variety’ is more often related to adaptability and the options for alternative accommodation for changing families in the same apartment block or estate. In this instance, none of the keywords used implies the capability for future physical alterations. Avi Freidman in \textit{The Adaptable House} (2002) defines the term as “\textit{refitting the physical environment as the result of a new circumstance}”\textsuperscript{35} but then goes on to take a slightly different position focusing on process. Adaptability, he proposes, can be introduced at three different stages of a project; at the initial design stage, at the construction stage or by the users.

\section*{Method and Approach}

\textbf{‘Picture books’}

My picture books build on the approach of the 20th century picture books in an attempt to provide analogous reference. They use architectural methods, drawing and typological classifications to present a series of building studies for comparison.

The book that accompanied the \textit{Accommodating Change} exhibition gave me the initial opportunity to experiment with using analytical drawings for comparative purposes. Unit plans and site plans were included, in a minimal way, on the inside covers as an

\begin{footnotesize}
\begin{enumerate}
\item Ferre, A and Tihamer, S. p. 4 The qualities summarized in the keywords are projects “…which exemplify outstanding innovations in construction systems, layout of residential space, systems of unit aggregation, integration of the residential program into the other functions that make up our cities, and repercussions in the formation of the urban fabric.
\item ibid p 5. The final four keywords grouped under the heading Flexibility are:- “10. \textit{Adaptability} Built space can facilitate and accommodate a great number of requirements and activities both predictable and unpredictable, for known and unknown uses. 11. \textit{Openness} Space is endowed with flexibility through the removal of traditional associations between functions and rooms in favour of the indetermination of fluid spaces 12. \textit{Spaciousness} The real luxury (and the platform for the effective development of multiple activities) is space. 13. \textit{Unit Variety} Residential projects no longer tend to respond to a single standard program and user. The diversity present in society is also translated into the spatial complexity of the project."
\end{enumerate}
\end{footnotesize}
addition to the architects’ original competition submissions, the main content of the book. In the three titles that followed, *New Urban Housing* (2006), *Key Urban Housing of the Twentieth Century* (2008) and *Patterns of Living: Hong Kong’s High-Rise Communities* (2013) drawings were specially made for the analysis and comparison of a series of case studies.\(^{36}\) 2D drawings, rather than perspective or axonometric projections were used as the works are intended for an architectural audience adept at reading drawings rather than a lay audience. Further for both *Key Urban Housing* and *Patterns of Living*, in addition to ensuring reproduction of drawings to a uniform scale and style I worked closely with the graphic designers on the page layouts.

Using the same method and approach, each title has a different focus. *New Urban Housing* looked specifically at projects completed in the recent five-year time frame organized by four formal typologies; terraces and row houses, quadrangles and courtyards, city blocks and infill, and towers and slabs. *Key Urban Housing* took an historical perspective to look at urban housing development through the 20th century. The publisher’s commitment to a ‘picture book’ – based largely on the belief that computers would make the process much faster and easier - was coupled with a desire to include projects from as many countries as possible. Both books were limited in extent and it was necessary to reduce the original long list of potential projects. It was clear that certain well-known twentieth century projects would be included, and I used a loose stylistic chronological categorisation to group them with others selected mainly for their innovative approach particularly to issues of flexibility. *Patterns of Living* focused on the work of one significant provider, the Hong Kong Housing Authority (HKHA) from their beginnings in 1954 to the present day. All prioritise drawings.

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\(^{36}\) Following the publication of Accommodating Change, each title allowed for an increased use of drawings as follows:

*New Urban Housing* 2006: Unit plans – as provided by architects. Block plans – new drawings from data provided by architects

*Key Urban Housing of the Twentieth Century*: Unit plans – new drawings from data provided by architects or sourced in archives and libraries. Block plans – new drawings from data provided by architects or sourced in archives and libraries. All drawings were provided as PDF and EPS files in Adobe Illustrator on a CD

*Patterns of Living*: Unit plans – new drawings from primary survey material. Typical block plans and unit plans – new drawings from data sourced in the HK Housing Authority archives
Drawings

*Drawing is language and memory, a means of communication with oneself and with others, construction.*  

Unlike other artists architects do not generally enjoy a close involvement with the fabrication of their work. They are distanced from production, obliged to use drawings as an intermediary to explain and provide direction to others on how to construct their works. But beyond this most direct role, highly stylised and codified architectural drawing is also the means to describe and understand architectural ideas. Drawing in Alvaro Siza’s words is “*amongst many other things, a working tool, a way of learning, understanding, communicating, transforming; a way of designing.*” Drawing becomes the essential tool but is also a means of expression, the subject of Peter Cook’s book, and in his words “*a motor that absorbs imagination and converts it into usable or transferable information*.” Cook mentions the use of text only fleetingly in a work that focuses primarily on drawings that are expressive of ideas. Text is used to a greater extent in descriptive or analytical drawings. Adrian Forty however devotes considerable effort to a questioning of whether text or drawings say the most. Drawing is clearly a very efficient way to describe three-dimensional form, and uses annotation when necessary to enhance the content, particularly at larger scale when greater precision is required. Perhaps the question is irrelevant? As Cook says perhaps the expressive nature of the drawing – the degree of rhetoric - changes to suit the audience from the most basic working drawing for builders, through those to discuss with colleagues and those to impress clients, to the “*Whizz bang for the newspaper.*” Anecdotally, architectural drawings have been more usefully compared to musical scores; they similarly rely on (Italian) annotation for enhancement but have a much more direct relationship with the music they describe than any evocation in a textual description could, irrespective of language. Similarly both rely on a particular and distinct talent for their creation and for their interpretation.

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37 Siza, A p.22
38 See Evans, R p.156 “I was soon struck by what seemed at the time the peculiar disadvantage under which architects labour, never working directly with the object of their thought,”
39 Siza, A p.17
40 Cook, P p.211
41 See Forty, A
42 Cook, P p.104
The conventions of orthographic projection and graphic technique for everyday design and production, as evidenced by professional journals, has changed little since the first decades of the 20th century. Presentation styles – when aimed at a non-professional audience – varied more, notably with a switch from the use of perspective to axonometric or isometric projections and of course can include scale models. By the 1970s the use of colour photography, became more prevalent, offering, it seemed, a more subjective and seductive description of completed buildings, rather than the black and white analytical drawings. At the same time the switch from Imperial to metric measurements in Britain in the early 1970s affected larger scale detail design drawings and specification terminology but made little difference at small scale as metric scales were easily approximated to established imperial scales.\textsuperscript{43} However, the introduction of computer drawing a decade later, along with its effect on expressive drawings and even on design, changed any perception of scale at the time drawings are produced. In the computer, anything and everything is drawn at any size and can be altered infinitely to be looked at or printed at any scale, irrevocably changing the way we make choices about content and legibility even in the simplest of analytical drawings.

Typologies
There is no doubt that for architects, straightforward analytical drawings are the fastest way to understand a building and its architectural ideas. Housing plans particularly, often without any need for sections or elevations, can be sufficient to reveal meaning. With the unchanging brief ‘to design a family house’ for an anonymous client, and often without even the inspiration (or constraint) of a particular site to influence decision making, housing design according to Sherwood \textit{“lends itself readily to systematic typological study.”}\textsuperscript{44} He speculates that architects’ use of existing models or prototypes is similar to the mathematicians’ use of an auxiliary theorem; that is they provide an approximate or analogous answer to a problem to be solved.

\textsuperscript{43} The differences between the most commonly used imperial scales and their metric standard equivalents were mostly barely perceptible (4%) e.g. 1/16 inch to a foot or 1:192 to 1:200, 1/8th inch to a foot or 1:96 to 1:100, ¼ inch to a foot or 1:48 to 1:50. The only perceptible difference is at ½ inch or 1:24 which became 1:20, 20% different, and some draughtsman continued to use the American standard 1:25 scale instead.

\textsuperscript{44} Sherwood, R p.2
He draws on Alan Colquhoun’s text *Typology as Design Method* which suggests that in a world where neither imitation of past styles nor the functionalism of modernism can provide all the answers, the “*intuitive methods of design traditionally used by architects are incapable of dealing with the complexity of the problems to be solved.*”\(^45\) Based on knowledge of history and the work of peers, an outline plan or ‘typological diagram’ can be used to *represent* a type - the type itself is positioned somewhere between the diagram and the word.\(^46\) Taxonomies of dwelling or unit plans are easily read and understood, aided by a discrete vocabulary or shorthand terminology, most often related to access arrangements. For Leupen and Mooij, in *Housing Design A Manual*, the starting point is the Italian architectural historian Giulio Carlo Argan’s (1909-1992) *On the Typology of Architecture* (1963), [in turn based on the work of the French theorist Quatremere de Quincy (1755-1849)] - which proposed three typological levels: firstly the overall configuration, secondly the major structural elements and thirdly the decorative elements. For residential buildings, because of their complexity, Leupen and Mooij propose a further classification. Called ‘the urban ensemble’, this is based on access arrangements and how the individual dwellings are organised as a whole.\(^47\) For the designers, reference to precedents classified by typologies becomes the basis of the ‘language’ of housing providing the analogous forms or the ‘auxiliary theorems’ borrowed from mathematicians, that enable better understanding of a problem to be solved.

As with all creative endeavor, there is argument against knowing too much, believing that a ‘blank page’ will provoke greater originality as argued by Till and Wigglesworth. They suggest that architects would be better approaching housing design from a wider perspective labeling the typological approach “*a peculiarly architectural description of the world*” and that the “*power of typologies is that these abstractions can be classified and subjected to rules, creating an introverted architectural world unto itself.*”\(^48\) There may be some sense in the idea that too much knowledge might be a hindrance to some possibly less experienced architects, however “*what we do know is that many*

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\(^45\) Colquhoun, A p.11  
\(^46\) See Leupen, B and Mooij, H Chapter 2 The origins of the concept of type using theatre as an example p.44  
\(^47\) ibid p.45  
\(^48\) Till, J and Wigglesworth, S p.152
renowned architects have an in-depth knowledge of architecture history and are extremely well informed about their colleagues’ work. Moreover it is evident that new typologies are invented as architects respond to the changing context for their work.

**Urban ensemble**

“Housing schemes should never begin as housing schemes but as urban designs. Designs for housing should be driven in the first instance by an idea about the city. We should design streets and public spaces first - domestic layouts should follow.”

Peter Barber is writing in support of the street but whether street, city block or isolated tower, it is almost impossible to describe a home or identify a dwelling type without simultaneously identifying the urban form to which it relates. Residential buildings are the most common building type in any city, forming the framework of the city and defining its grain or texture. Whether the prevalent type is terraced or row houses, blocks or isolated towers, knowledge of the ‘urban ensemble’ is necessary to complete the picture of the locality and the way that the inhabitants might occupy their private space and the surrounding neighbourhood.

However, architecture has often ignored the complexities of the structure of the urban environment and particularly its constantly changing nature. My 1994 discussion of the urban environment considered the limitations of much architectural history and theory that privileges the visual and sees architecture as part of a static formal composition, like a fine art piece. It concluded that “the street and the outside spaces of the city are as important if not more so than the buildings they relate to. Whether in the town or the country the road represents the ultimate shared spaces and our right to travel it. There are no enclosures, no threshold, no barrier to our movement along it.” Based on the study of Heidegger’s phenomenology, it explored his writings on building and particularly his ideas of time and ‘permanances’ and their usefulness as a way to understand the complexities of the continually changing urban landscape.

49 Leupen, B and Mooij, H p. 41
50 Barber, P p. 19
51 French, H A Sense of Place a Sense of Freedom Report submitted for the UCL MSc 1994
The notion of the city as ‘non static’ gained popularity from the 1970s onwards as a reaction to the prevailing ideas, rooted in the visual, picturesque traditions typified in such works as Gordon Cullen’s *Townscape (1961)* and Kevin Lynch’s *The Image of the City (1960)*. At the time, Aldo Rossi’s thesis *The Architecture of the City* (1966, Eng. 1982), presented a timely new approach to the idea of the city, defined as the ‘analogous’ city which proposed an urban morphology based on cultural and social considerations. Instead of modernism’s *tabula rasa*, he identifies what he names certain ‘permanences’ or ‘persistences’ i.e. elements that continue, coupled with a typology of vernacular and neo-classical architectural form. Streets are the prime example of persistences. His classifications, of ‘inhabited real estate’, which are described as descriptive, geometric or topographic are the now familiar categorisations; isolated slabs/towers, terraces, city blocks and courtyard buildings. Meaning, he posits, develops through use and activity over time - the image of the city is not fixed – and will be viewed and interpreted differently over time.

In 1981, Lionel Esher includes in the final chapter of his seminal work *A Broken Wave* the statement “*we should cease to lay claim to the environment as a primarily visual experience, ...it is a great deal more that that; it is apprehended by all the other senses and some we scarcely understand. We no longer expect people to stand back like tourists and gape at our buildings, but simply to use them as they use a pub or market.*” A similar idea is expressed by Nigel Coates, in conversation with Alicia Pivaro, “*Architecture is a public art, a setting up of frameworks which are never absolute in use or interpretation*”

The section that follows gives an overview of how the scant history of flexible housing has been represented in the context of my works. My work has not intended to invent new classifications of housing typologies but has applied the familiar language of the

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52 Rossi, A p.18
53 ibid p.49. His classifications are: 1. A block of houses surrounded by open space; 2. A block of houses connected to each other and facing the street, constituting a continuous wall parallel to the street itself; 3. A deep block of houses that almost totally occupies the available space; 4. Houses with closed courts and small interior structures.
54 Esher, L p.296
55 Coates, N p.324
interrelationship of ‘plan configuration’ and the ‘urban ensemble’ in a range of case studies. In general my work does not focus on urban typology although this has been used as a curatorial device. It uses drawings of block plans in combination with unit plans to support the idea of the “interdependence and symbiosis between house and city”\textsuperscript{56}

\textsuperscript{56} Oostenbrink, M p.41
Unconventional Families

“although social structures have changed considerably in the past decades-with the results that the significance of the average nuclear family continues to decline-the typical apartment floor plan is still almost exclusively designed for the needs of just such a family…”57

The rather obvious need to house many different kinds of ‘families’ continues to be largely ignored by volume house builders. Mostly they repeat the same identical – usually two storey, three bedroom - house type, preferring to market their homes to the idealised version of the ‘conventional’ family – the working man, his wife who looked after the home and, probably, two children. As early as 1937 the introduction to *The Modern Flat*, which urged architects to take more interest in housing design, provided an inclusive definition of the family “...(it) may consist of a single person, living either alone, or with friends, or it may consist of man and wife, with or without children, and/or other dependents.”58 The 1944 *Housing Manual* proposed that other versions of the ‘family’ should be accommodated by providing dwellings of different sizes in new housing estates. “In addition to the three bedroom houses, a proportion of larger houses for large families and of smaller dwellings for old people, single people, and others whose needs cannot be met by the emergency houses, will usually be required.”59 Then, only five years later, the 1949 *Housing Manual*, takes this one step further stating that the housing shortage would not be solved with only ‘the normal family houses’, but suggests there is a need for ‘a much greater variety of types of houses, some larger, some smaller……in order to meet in a balanced way the varying requirements of the population as a whole”60 but leaving the decision on the make-up of any estate to the Local Authority which was expected to have better knowledge of its neighbourhood.

57 Schittich, C p.9
58 Yorke, FRS and Gibberd, F *The Modern Flat* 1937 p.7
59 *The Housing Manual* 1944 Para 30
60 *The Housing Manual* 1949 Introduction p11
Throughout my work, I have resisted treating housing designed for students, the elderly, the mentally ill, or any other kinds of singletons as a separate subject and have included examples of such housing schemes alongside other kinds of homes. Although it has been largely ignored by volume house builders and often not subject to the same legislative frameworks, and considered as only temporary accommodation, housing for single people, particularly students is nevertheless an increasingly significant element in many cities.  

From time to time, smaller than normal – ‘micro flats’ or their current incarnation as Pocket Living supported in London by GLA funds – are reinvented as a way to provide affordable homes for young people unable to buy at market prices. Often criticised for the resulting higher density and pressure on local amenities and parking spaces with more dwellings to the acre, they will more likely simply contribute to further house price increases through increased price of land and become new pieds-à-terre for the very rich. But we must ask ourselves about the absolutes; can reasonable accommodation be provided in a smaller space than the minimum standards? In Japan, for example, the much higher densities of cities such as Tokyo have long supported much smaller dwellings than those in British cities. One of the best known in modern histories is the Capsule Tower (1972) (Fig.4) designed by Kisho Kurakawa (1934-2007) which is also one of the few built examples of the contemporary ideas about the non static city and flexibility. “The building can be thought of in two parts. One is the fixed structural towers ….. The second element, …. is the individual ‘pods’: manufactured ..... in a factory and brought to site to be attached to the superstructure, they are more like pieces of equipment than dwellings.” In England, the smallest living spaces are those built for students and although undersized are now generally of a

61 “We have seen extraordinary growth in UK student numbers over the past 20 years and while UK student numbers are now stabilised, international student numbers set to rise dramatically in the next decade. The provision of good quality student accommodation was traditionally the responsibility of the universities but in recent years, most new accommodation had been provided by private investors and developers.” J Hillman chair of JLL Alternatives http://www.propertyfundsworld.com/2015/09/22
62 Census comparisons 2001-2011 in England and Wales. In relation to the increase in the overall population, there was little change in the number of one-person households. However there was a twofold increase in persons in communal establishments and a fourfold increase in other households. The number of one family households reduced by 50%. See http://www.ons.gov.uk
63 https://www.pocketliving.com/homes/ebook
64 http://www.theguardian.com/uk-news/davehillblog/2013/sep/06/boris-housing-covenant-pocket-homes
65 French, H Key Urban Housing pp.142-3
high quality and like hotel rooms are provided with en-suite bathrooms allowing them to easily double up as conference accommodation during the vacations. Walter Menteth’s scheme at High Cross Road in London (2007) (Fig. 5), reinvents the two-storey terraced house in miniature – just 47 m² – to provide accommodation for mental health residents. On one side, the houses maintain the conventions of the street, on the other they open on to a protected, shared, courtyard garden. Peter Barber has also devised similar small terraced houses referred to as ‘micro houses’ with a mezzanine above the living space, based on almshouses, for a soon to be completed scheme in Holmes Road, London. ‘Efficiency’ apartments or ‘apartment hotels’, which vastly reduced the space of a normal flat, appeared in the early 20th century in New York and other big cities in the US, until they were outlawed by changes to legislation. In London, the Lawn Road Flats (Isokon) (1934), which epitomized the idea of the ‘bachelor apartment’, provided private living space with the services of a hotel, such as laundry, cleaning and communal food preparation.

The most extreme version of minimal living space was to be introduced in the Soviet Union in the early 20th century. Following laws passed in 1918 to nationalise land and abolish private real estate, a new social order was to be introduced that would rely on a reassessment of the family and the design and construction of new kinds of housing. Efficient and minimal private spaces would allow for separate social spaces such as gyms, nurseries and canteens. The best known is the Narkomfin (1930) (Fig.6) in Moscow, attributed to Mosei Ginzburg in his role as head of the standardisation section of the construction committee. The building, which has an ‘F’ type ‘transitional’ plan, is best known for its clever split level section and double height space rather than its minimal approach and is commonly considered the forerunner of Le Corbusier’s Unité section. The idea of the minimal dwelling – using efficiency to provide basic workers housing of high quality - was the focus of the CIAM congress in Frankfurt in 1929 and many less extreme versions followed. As a type, the shared

66 French, H Key Urban Housing University Centre Housing, Urbino, Italy, Giancarlo De Carlo 1973-83 p.144 and New Urban Housing Westfield Student Village, Queen Mary College, London 2004, Fielden Clegg Bradley pp.60-63, Simmons Hall, MIT, Cambridge USA 2002 Steven Holl pp.112-16
67 http://www.peterbarberarchitects.com/holmes-gardens
68 French, H Key Urban Housing pp.38-39
69 French, H Key Urban Housing pp.56-59
70 French, H LivingTogether p.35
kitchens and other elements of communal living arrangements are accepted as the norm for student housing and other versions have appeared from time to time. Shared housing (HMOs), whilst eminently practical in many ways, to provide for singletons or any other wider definition of ‘family’, has clearly presented a considerable challenge. Apart from the introduction of the two-bed two-bathroom apartments developed for London’s increasing buy-to-let market in recent years, house builders continue to ignore all but the idealised view of the conventional family. Moreover, as well as persisting with a very narrow view of its make-up, house builders persist in treating the ‘family’ as a static entity. Whatever ‘shape’, the family needs change as people grow older. Clear directions in the government publication Homes for Today and Tomorrow (1961), which led to the publication of the Parker Morris minimum space standards, acknowledged that a ‘family’ – of whatever make-up - would change over time. “In addition to changes in the size of families, ways of life in the home will also change during the family cycle.” Designing flexible homes that would accommodate such changes would seem to be the logical next step.

**Flexible Housing or Tight Fit Functionalism**

“In the UK, houses are sold by number of rooms and designated room types instead of overall floor area. Status and thus value lie first in the number of rooms rather than their size. Spaces are designed down to the absolute limits of their designated function, often determined through their furniture layouts.”

Flexibility, is a very broad term. In its most obvious literal sense it is applied to the use of dynamic elements, sliding partitions, or foldaway furniture that mean spaces can be immediately altered. We are familiar with the magical transformation made possible by sliding and folding partitions in the first floor of the Schröder House (Rietveld 1924) in Utrecht but this is not the most common application. At its most basic the term means that it is possible to rearrange the furniture; for example windows, doors and

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71 See French, H Living Together in Impossible Worlds the Architecture of Perfection, for a history of communal and collective living projects
72 Schneider, T and Till, J p.36
even electric sockets are positioned in such a way that allows this. At the other extreme, at a much larger urban scale, it refers to the idea of a structural ‘support’ system that allows for separate, even individually designed, units to be inserted. Somewhere between the two is an opportunity for the design of housing which is more adaptable - designs that can accommodate significant physical alteration instigated by the residents. This can be achieved in various ways. Firstly, designing the structure and services in a certain way can mean that the overall space of the house can be extended externally with extensions and additions. Secondly, an approach to the design of structure and services means that the internal partitions can be easily moved so the interior can be altered or remodelled entirely. Both can accommodate changes over a period of years as family circumstances change. Thirdly, layouts that allow rooms to be thrown together or separated, and incorporate winter gardens or enclosed loggias allow residents to alter their homes much more quickly for social occasions, or from winter to summer to accommodate different activities. There is also growing interest in the idea of undifferentiated space or indeterminate space that allows the inhabitants to decide on their use. Importantly flexible designs imply that the residents have a right to involve themselves in the process of designing their environment and that architects must extend their thinking to imagine how people might choose to live with alternative layouts rather than fixed, perfected layouts.

It is difficult to date precisely the introduction of ideas of flexibility in housing design. According to architectural historian Adrian Forty “Although...... particular elements of flexibility had been acknowledged in works of architecture produced earlier, as a general architectural principle, the word flexibility entered currency around the early 1950s.” The earlier works he cites are the Shröder house in Utrecht (1924) and the Maison du Peuple in Clichy (1938) both in his category of ‘Flexibility by Technical Means’, i.e. with moving walls and floors. All of the versions of ‘flexibility’ outlined above had been demonstrated in housing projects much earlier. For example all appear in different buildings in the Weissenhof model housing exhibition of 1927. Mies Van der Rohe’s, prominent four-storey block (Fig.7), “achieved the idea of flexibility in

73 Forty, A. p.142
74 Forty, A, The other “distinct strategies of ‘flexibility’ in architecture” he identifies are Redundancy and As a Political Strategy. pp 142-48

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all its various interpretations.”\textsuperscript{75} It has a simple linear form with structural elements limited generally to the exterior of the building and just a few carefully positioned interior columns. Windows are arranged as a continuous horizontal band and there are regularly placed vertical shafts for the access stairs coupled with ducts for plumbing. This arrangement is one of the earliest examples of a ‘frame’ structure that allowed for several different partition configurations resulting in a variety of apartment layouts of different sizes. At a later date, the whole of the interior could be demolished and redesigned with a different configuration whilst leaving the building intact. Some of Mies’ interior layouts also incorporated sliding partitions that allowed for change over a much shorter time, an idea seen in earlier American efficiency apartments and central to the design of Andre Lurçat’s row of terraced houses (Fig.8), at the Vienna Werkbund (1932).\textsuperscript{76} Lurçat’s houses looked at the use of space over 24 hours and proposed folding beds that could be hidden away during the day allowing the space to be used for other purposes. The houses also incorporated a new kind of indeterminate space – labeled a ‘breezeway’ - a kind of buffer zone between the public domain and the private space of the home and a terrace at roof level that allowed the possibility of extension.

Despite interest in the modernist ideas shown at these exhibitions, there is little evidence to show any impact in housing practice or theory until the 1960s when the Dutch architect, John Habraken (1928-), director of SAR (Netherlands Foundation for Architects Research) from 1965 to 1975 published what is now considered to be the key work in the field of flexible housing entitled \textit{Supports, an Alternative to Mass Housing} (1962).\textsuperscript{77} On reflection we can see the ideas contained in his work realised in other projects of that time; buildings that implied a flexibility through a clear differentiation between infrastructure and infill such as Piano and Rogers’s Pompidou Centre (1977) in Paris, or Cedric Price’s Interaction Centre (1973) in London. In a lecture given by Habraken on the publication of his book in English in 1972, he stated

\textsuperscript{75} French, H Key Urban Housing p.48 and New Urban Housing p.14
\textsuperscript{76} French, H Key Urban Housing p 62-63 and New Urban Housing p.15
\textsuperscript{77} A formal research network was established in 1996 ‘The Open Building Network’ reflecting current international interest in building on the work of Habraken’s \textit{Supports} although often using other terms such as ‘Free Plan’, ‘skeleton infill’, or ‘raw space’ housing. http://www.open-building.org/archives/Reflections_on_the_History_and_Future_of_Open%20Building_and_the_OB_Network.pdf
that, the architect is ‘the one person who tries to bridge the gap between human needs and technical possibilities. He is trained to think in these two worlds, and he tries very hard to do so.’\textsuperscript{78}

Habraken noted the frustration among architects that they were unable to operate adequately in these ‘two worlds’, constrained by bureaucracy or industry. He is very clear that setting up SAR, with a group of 10 other architectural practices, to investigate the possibility of making an impact on the housing process, would necessarily involve defining a new role for the architect. The architect and writer John Worthington reinforces the idea that it is the process which is more important to Habraken’s thesis rather than any resultant designed projects, stating, in his 1973 review, that “it overstates its case, lacks detail to give it credibility and does not .... do Habraken’s ideas justice ....”\textsuperscript{79} He claims that there is ample precedent for the idea of the support or infrastructures and uses examples, both built and unbuilt, of emergency housing in Kowloon (1957) and Archigram’s Plug-in City (1964). Worthington stresses that the importance of Habraken’s thesis is the alternative way to view the housing process and the role of the architect; i.e. that the ‘support’ can be designed and produced entirely separately from the infill or fitting out which can be left for others to carry out – even the end users, the residents themselves.

As Worthington pointed out, ideas of flexibility – that implied change through the separation of structure and infill particularly - were current in architectural thinking in the 1970s. Ideas of flexibility in housing, championed by early modernists, were seen by some to offer an ideal solution. In 1973, a major journal article in support of flexibility or adaptability\textsuperscript{80} reviewed current adaptable housing projects across Europe in the context of an historical overview. It summarised the prevailing conditions in the decades since the war; the housing brief had grown but space had not. Leisure time had increased and already small homes had more tools and appliances for laundry, gardening, maintenance or car repairs, but no space for them, with the result that “the

\textsuperscript{78} Habraken, J RIBAJ Nov 1972 p.471
\textsuperscript{79} Worthington, J AJ May 1973
\textsuperscript{80} Rabanek, A AD 1973 p.698
home has become a cross between a motel room and a storage bin for the clutter of the (often clashing) life-styles it has to contain"\textsuperscript{81}

The article goes on to state that a change in the process is required. Minimum space standards and the anthropometric studies, such as those in *Space in the Home* (Fig.9) only served to focus architects’ ingenuity to ‘miniaturise’ and perfect their plans to satisfy each ‘need’ identified resulting in what was then termed a ‘tight fit functionalism’. The conclusion is that it is not only necessary to provide more space to better suit contemporary lifestyles, but it is necessary to provide adaptable space that allows users some degree of control over how they occupy their own home.

**Housing and Consumers**

“The designs generally have fewer elements that can be personalised, show less opportunity for change – fewer surfaces which can be repainted; fewer forms which can be modified; fewer parts which can be changed – than in the average spec-built house . . . Often there are no spare bedrooms for visitors, and where they exist they are not large enough for other activities.”\textsuperscript{82}

The period of large-scale expansion in public housing during the 1950s and 1960s had resulted in increasing criticism of monotony and lack of character, offering poor quality and little means of self-expression for the residents. Mass housing schemes had, it seems, reduced the inhabitants to anonymous consumers and Local Authorities felt a growing need to involve them somehow in the design process, to encourage a more positive response. Surveys were fashionable and community architecture groups were set up but few had much impact on design or development plans. The best known experiment with user participation is the Byker Wall scheme started in 1968, in Newcastle-upon-Tyne by Ralph Erskine (1914-2005). The scheme relied on a particular set of circumstances rehousing existing tenants on the same site “the architect’s ‘open door policy’, their ‘plan of intent’ rather than a more intimidating or alienating master

\textsuperscript{81} ibid.
\textsuperscript{82} Rapoport, ARIBAJ July 1968 quoted in Pawley, M p.96
plan, and their exhaustive consultation made this a model of ‘community architecture.’\textsuperscript{83} Despite projects like this, and there have been relatively few, information about how people would choose to inhabit their homes is still largely unknown. Walter Segal\textsuperscript{84} pioneered self build using a modular timber frame method that encouraged collaboration and high-density suburban housing projects built by Span\textsuperscript{85} included communal parking lots and legally constituted residents associations giving occupants control of the estates. Other than a few such projects, housing architects, like volume house builders, have not generally developed any closer relationship with consumers.

Many architects are still resistant to the idea that others could offer anything to the art of housing, preferring to rely on professional expertise. Indeed, Neave Brown (1929-), renowned Camden Council housing architect for the well known Alexandra Road (1968-78) scheme amongst others, in a recent lecture at the RIBA\textsuperscript{86} stated that he still believed that it was the architect’s job – as an expert - to propose what they think is the best way forward, not to respond to surveys, nor to try to interpret clients’ ideas about what they think they want.

Whether we agree or not with Brown’s position, having more information about changing patterns of occupation could contribute to improvement in design quality. Research in the field of how people live is hard to find; the difficulty in gaining access to private dwellings, and the possibility of carrying out such work with a sufficiently sized sample in comparable homes deters researchers. Few architects have changed their approach as the result of such research or discoveries. Notably Giancarlo De Carlo admitted his own failings, having followed modernism’s logical principles in one

\begin{itemize}
  \item \textsuperscript{83} French,H Key Urban Housing pp.174-175
  \item \textsuperscript{84} “The name of the late Walter Segal is now synonymous with self build housing. Whenever people meet to discuss what they could do to house themselves, someone mentions the Segal system of quickly-built, timber-framed dwellings which are environmentally friendly, and seem to generate friendship among the self build groups that have succeeded in housing themselves this way. The Segal approach was essentially that of the medieval English house, or the American frame-house, or the Japanese house, but with the timber frame calculated and based on modular dimensions to avoid waste and to facilitate alterations and enlargements. He sought to eliminate or reduce the ‘wet trades’ of concreting, bricklaying and plastering, by reducing the sheer weight of the building and by using cladding, insulating and lining materials in their standard sizes.” http://www.segalselfbuild.co.uk
  \item \textsuperscript{85} See The Spirit of Span Housing, James Strike, 2005. Span built thirty housing estates between 1948 and 1984. Chap 6 p 57 “It was always the intention of Span that the residents should take an active interest in the management of the estates, both socially and in looking after the buildings and grounds”
  \item \textsuperscript{86} Brown, N RIBA 22 March 2016 https://www.youtube.com/watch?v=HX-uyfC2N0s
\end{itemize}
of his housing projects in an article in Casabella in 1954. Walking past the building he observed that the residents were using their private, quiet, sunny balconies that afforded them views across the adjacent landscape to hang their laundry and instead were sitting out on the north facing access balconies. Importantly for them, but not considered by the architect, from there they could see the street and engage with their neighbours. Phillippe Boudon’s book *Lived in Architecture* that records the adaptations made to Le Corbusier’s 1925 housing scheme in Pessac, Bordeaux, remains the only publication of its kind. A photographic survey shows major alterations to the buildings – strip windows replaced with standard casements, roof terraces enclosed, storage space infilled - and interviews with the residents set out considerable detail of their understanding of the architectural ideas and their own interpretations. It was not Le Corbusier’s stated intention that these houses should be adaptable but it is interesting to note that the original plans show largely indeterminate spaces and an open staircase somewhat in contradiction to other plans of the time when he was advocating tight functional planning.

In contrast with Boudon’s work, and the very obvious ways in which occupants have altered the architecture externally and the fabric of the buildings, the survey carried out for our *Patterns of Living* project in Hong Kong, focused entirely on the domestic interior and the ways in which families have organised a series of identical flats. From the exterior, apart from their quantity and proximity, the tower blocks of Hong Kong are indistinguishable from tower blocks anywhere else. They appear in rows or dense clusters, rarely as isolated independent buildings. Once inside, however, they are very different. Space standards are very small and for the residents, organising their internal layout themselves in an indeterminate space is the norm, even in public sector rental flats. Since 1954, when it was first established, the HKHA, under the direction of

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87 See French, H Key Urban Housing pp.94-5 for discussion and references
88 Boudon, P pp.30-32
89 Our survey of the interiors of dwellings in Hong Kong high-rise buildings borrows from ethnographic research methods. The information was gathered by design students in their first year of study, who were asked to focus on the architecture and interior of their own home, and then their neighbours’ and friends’. There are clearly limitations to the objectivity of any such study but whilst the students could not be considered knowledgeable informants in architectural terms, they can all be seen to belong to one group, as all apart from one, were still living in the family home. Almost all returned with drawings and photographs of standard public housing types, generally those designed and built by the Hong Kong Housing Authority.
90 The standard ‘Harmony’ type in production since 1982. 3 Bed 5 Person flat is 52.5m² 2 Bed 4 Person 43.5m² Source HKHA. The New Nationally Described Space Standards are 86m² and 70m² respectively
British architects, has developed a sophisticated high-density, high-rise housing stock based on the same modernist principles employed in England. The very earliest flats, the Kowloon emergency housing blocks, provided the very bare minimum of a single room for refugee families. More recent flats have a kitchen, washroom and a balcony or loggia (Fig.10), an improvement on the shared facilities of the original emergency housing but the main habitable space is often still just one single room – an indeterminate space.

**Indeterminate and Monofunctional spaces**

“...the specification of standards of space by reference to individual rooms with specific labels – bedrooms, working and dining kitchens, and so on – tends to assume a conventional arrangement of the dwelling and the particular way in which a given room will be used. This inhibits flexibility......”

Indeterminate space, sometimes referred to as ‘raw space’ or ‘free plan’, is space that can be used for any purpose. A scheme in Leipzig (2000) (Fig.11) by Hentrich Petschnigg & Partners\(^2\) has similar intent to the HK flat type. The only fixed elements in the plans are the entrance and the bathrooms; there are no internal structural elements and the modular façade can allow for a variety of partition positions. Even a single unlabelled room would be unusual in British housing projects although some urban residential projects have successfully developed a version of the indeterminate space, referred to in estate agent jargon as ‘lofts’, an American term for the English warehouse. The type dates from the 1960s and 70s, when abandoned 19th century warehouses that were priced out of many city centres became available as residential spaces. With low ceilings, deep plans and very little daylight from a distant street façade, partitioning was not a viable option and they resulted in single open plan spaces. The Yerba Buena Lofts (2002) (Fig.12) in San Francisco is a typical example of a “...loft, or warehouse, design - low floor to ceiling height, deep plan and a close structural grid. To make the building habitable however every unit includes double

\(^{91}\) Homes for Today and Tomorrow para.12 p.4
\(^{92}\) French, H New Urban Housing pp.71-75
height living spaces.” A more unusual experiment in indeterminate space is the pair of Estradenhaus (1998 and 2001) (Fig.13) in Berlin, “Instead of a conventional layout of a series of rooms with designated purpose, two unusual spatial devices - podiums at each end and moveable screens along the length - are introduced that invite occupants to engage with the space on their own terms. They can divide it in different ways, over time to suit changing family needs, or in the short term for a particular event.” Other architects have exploited the ‘loft’ type, generally offering larger than usual open plan living spaces. Examples include Nemausus (1988) in Nimes by Jean Nouvel and the Mondrian Apartments (2002) in Sydney by Stanisic Associates.

The most common approach to flexibility is to include scope for some easily manageable variation within the constraints of a more conventional plan. Leon Wohlhage Wernik’s Schlesischestrasse (1994) (Fig.14) scheme in Berlin “attempts to avoid the limitations of minimum space standards by designing flexible internal layouts. There is little differentiation in room size and type, and, typically, wide sliding doors mean that rooms can interconnect, allowing the occupants some choice between a more conventional separation of spaces and a more open-plan layout.” Similarly Walter Menteth’s Consort Road in London (2007) (Fig.15) allows residents some choice of use of rooms “On the first floor, either of the two equal sized rooms….can be used as a second living room or might for example be a playroom or study” and “…wide sliding doors between the living room and bedroom means that the spaces can be thrown together or separated. Winter gardens on the street side offer the option to be left open or closed off.” At Fredensborg, in Denmark, an example of Jorn Utzon’s courtyard housing (Fig.16) has an external version of a multipurpose space in the centre of the house. Conceived as the focus for the everyday activities “It is designed as a neutral space that can be occupied in a variety of ways to suit the inhabitants.

93 French, H Key Urban Housing pp.216-17
94 French, H New Urban Housing pp.100-103
95 French, H Key Urban Housing pp.178-79
96 French, H New Urban Housing pp.80-85
97 French, H Key Urban Housing pp.200-201
98 ibid pp.226-27
Without changing the basic nature of the houses, the courtyard can be used as dining room, workshop, garden or playground for children.\(^{99}\)

Encouraging extension or addition as part of the design is a key part of two similar contemporary schemes, \textit{Sold Pedro Prado} (2003), in Chile by Elemental, and the \textit{Donny Brook Quarter} (2002) (Fig.17) in London by Peter Barber,\(^{100}\) the winning design for the AF competition \textit{Accommodating Change: Innovation in Housing}. The terraced houses are arranged in such a way with external patios and terraces that invite the residents’ intervention. Whether the second half of the house (part of the funding strategy in Chile to reduce costs by building one half only) or the lean-to shed or conservatory in London both provide a supporting rather than a constraining structure. In Alvaro Siza’s, Quinta da Malagueira (1977) (Fig.18) housing, almost certainly an inspiration for both schemes, “\textit{flexibility is an intention of the scheme. The construction of the units with the different options available, means that they can be extended at a later date.}”\(^{101}\) Similarly, Leon Wohlhage Wernik’s South Biesdorf housing scheme (1999) (Fig.19) in Berlin, whilst largely conventional in terms of its plan type provides either a roof terrace “\textit{intended to provide for the potential for later expansion, or an additional externally accessible space for a lodger or nanny.}”\(^{102}\)

Apart from the longer term remodeling opportunities for building owners, flexibility in the interior spaces of an apartment allows the inhabitants a degree of independence to organize their furniture and belongings and arrange their living space to suit themselves, a means of self-expression. For many architects it is clear that a flexible design approach for the individual dwelling is considered a reasonable aim. For some, attention to the exterior of the block is seen as equally important because of the sense of identity it establishes. The Dutch architectural practice MVRDV are at the forefront of recent thinking that sets out to avoid the monotony frequently found in large housing schemes by setting out to make individually identifiable elements part of the

\(^{99}\)ibid pp.130-31
\(^{100}\)French, H New Urban Housing pp.94-95, AC
\(^{101}\)French, H Key Urban Housing pp.156-57
\(^{102}\)French, H New Urban Housing pp.30 - 33
architectural whole. The apparent ‘patchwork’ façade of *Silodam* \(^{103}\) (2002) (Fig.20) in Amsterdam is repeated in the *Mirador* \(^{104}\) (2004) in Madrid reflecting the idea of separately recognisable ‘mini neighbourhoods’ grouped into one ‘superblock’.

For other architects, the unity of the block as a singular element in the urban fabric takes precedence. Two schemes show how flexibility can be provided, through external balconies that extend the interior space – but behind a screened façade, therefore maintaining the overall coherence of the block from the exterior. The infill scheme on *Rue des Suisses*, Paris (2000) (Fig.21), by Herzog & de Meuron has a uniform shuttered façade; “*Shutters on the façade of the centre block... mean it, too, is not static but changes to suit the residents’ need for shading or desire for privacy. Directly behind the shutters each apartment has a narrow balcony along its entire length, accessible from each of the rooms...*”\(^{105}\) FOA have taken a similar approach to their *Carabanchel* scheme in Madrid (2007). Additional external balcony space on both sides can be used with the indoor space “*The relatively narrow, tube like space of each apartment is ... free of any structural elements. The width of the building is extended at both ends by terraces... enclosed with sliding and folding screens....The screens provide shading from the strong sunlight, and residents can open them up in different configurations in order to use the terraces as part of the inside space of the flats.*”\(^{106}\)

**Finally**

“*The public have a right to expect that even the most distinguished architects should give their best attention, for the general good, to a question (housing) of so much social importance.*”\(^{107}\)

It is clear that since the earliest housing legislation that focused on design quality rather than construction issues, little improvement has been made in terms of space

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\(^{103}\) French, H Key Urban Housing pp.202-203
\(^{104}\) ibid pp.222-25
\(^{105}\) ibid pp.210-11
\(^{106}\) ibid pp.228-29
\(^{107}\) From Robert Kerr, *On the problem of providing dwellings for the poor in town*, in RIBA Transactions series 1, volume and xvii 1866 pp.39-56 quoted in French, H New Urban Housing p. 9
The low density, garden city principles advocated by Raymond Unwin and set out in the Tudor Walters report of 1918 were eagerly adopted by volume housebuilders yet the recommendations for different sized houses, variations in layout and for flexibility were largely ignored. Recommendations for accommodating changing families or flexible dwellings of any kind continue to be largely ignored although the result of any requirement for flexibility would almost certainly be bigger spaces. Recent changes in estate agent listings to include floor plans and measurements might contribute to a better-informed consumer but overall size has not yet entered into common parlance. We still hanker after the additional rooms beyond the basics that imply status and value. In his essay, The Mobile Home on the Range, John Brinkerhoff Jackson writing in the context of American landscape, posits that the monofunctional space is related to class with its roots in the 19th century when houses for the rich sought to provide dedicated spaces for every kind of activity, separated from the servants with corridors. He sees the continuation of this phenomenon, with ‘media and entertainment centres, hobby rooms, exercise rooms and super-bathrooms.’ And concluding that defining space whether inside or outside by content or function is an unnecessary imposition. “The only significance is that the working class home has been largely immune to the appeal of the monofunctional spaces. The house may well contain many rooms, but most of them serve several uses, uses which can change from hour to hour or day to day. The garage serves as a storage room, then becomes a workshop. The kitchen is where we watch television and cook and eat; the dining room - if there is one - is for homework. The out-of-work brother-in-law sleeps on the living room couch, and the men in the family tune up the second-hand car on the patch of lawn. These are strictly temporary expedients. All or almost all, spaces in the house can be shared and used in a variety of ways.”

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108 See Appendix 1 for chronology of legislation, reports and recommendations on standards in housing
109 Jackson, J B p.65
110 ibid. p65
Bibliography

Sources listed below are those consulted and referred to in addition to those in the submitted works.

Government manuals, reports, pamphlets, internet sourced regulatory frameworks, recommendations and reference to relevant legislation are listed in Appendix 2.
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Rabeneck, Andrew, Sheppard, David and Town, Peter *Housing flexibility / adaptability?* AD February 1974 pp.76-90

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Appendix 1  Chronology of regulatory framework

The following is a chronology of regulations, legislation, reports and explanatory and advisory information related to housing with brief notes on key content.
<table>
<thead>
<tr>
<th>DATE</th>
<th>ACTS, REPORTS, ETC.</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1774</td>
<td>The London Building Act</td>
<td>Focused on the quality of building construction</td>
</tr>
<tr>
<td>1841</td>
<td>The Metropolitan Association for Improving the Conditions of the Industrious Classes</td>
<td>Founded in Spitalfields, London</td>
</tr>
<tr>
<td>1842</td>
<td>The Chadwick Report on The sanitary conditions of the labouring population of Great Britain</td>
<td>To improve conditions in slums</td>
</tr>
<tr>
<td>1844</td>
<td>The Shaftesbury Society</td>
<td>Responsible with Henry Roberts for the model dwellings built for the 1851 Exhibition.</td>
</tr>
<tr>
<td>1846</td>
<td>The appointment of the first medical Officer of Health (William Henry Duncan in Liverpool)</td>
<td>First in London John Simon, in 1848</td>
</tr>
<tr>
<td>1855</td>
<td>Nuisances Removal and Diseases Prevention (Consolidation Act)</td>
<td>Power of entry to ascertain course of drains</td>
</tr>
<tr>
<td>1862</td>
<td>The Peabody Trust</td>
<td>Such societies were aimed at encouraging investors to build housing for rent</td>
</tr>
<tr>
<td>1866</td>
<td>Sanitary Act</td>
<td>Local Authorities to be responsible for drains, water and street cleaning. Houses to be connected to sewers.</td>
</tr>
<tr>
<td>1868</td>
<td>The Torrens Act</td>
<td>To ensure that landlords assume responsibility for keeping properties in a state fit for human habitation</td>
</tr>
<tr>
<td>1875</td>
<td>The Housing Act (Artisans’ Dwelling Act)</td>
<td>Compulsory purchase rights for Local Authorities in larger towns</td>
</tr>
<tr>
<td>1875</td>
<td>The Public Health Act</td>
<td>Local Authorities empowered to inspect privately owned properties and to condemn those considered unfit</td>
</tr>
<tr>
<td>1875</td>
<td>The Public Health Act Section 157</td>
<td>Local Authorities empowered to make by-laws for layout of streets.</td>
</tr>
<tr>
<td>1877</td>
<td>Introduction of first set of Model Bye Laws (Government)</td>
<td>Leads to what became known as 'by-law housing' 1880-1914 generally for rent built by private developers (650-850 sq ft / 60-80 m²)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>By this stage legislation has gone beyond the basics to ensure adequate structural and sanitary measures and begins to focus on types of houses and street layouts.</strong></td>
</tr>
<tr>
<td>1888</td>
<td>London County Council (LCC) was formed</td>
<td>Tenement block building begins (familiar in Scotland and France but new to England)</td>
</tr>
<tr>
<td>1890</td>
<td>Housing of the Working Classes Act.</td>
<td>Local Authorities empowered to purchase land and develop housing</td>
</tr>
<tr>
<td>1895</td>
<td>Boundary Street Estate, Bethnal Green, London</td>
<td>Acknowledged as first of a kind - to plan the whole area not just the individual buildings.</td>
</tr>
<tr>
<td>1890</td>
<td>Employee model villages</td>
<td>Examples: Cadbury's Bournville, 1893-1900, Rowntree's New Earswick 1902-04, Lever's Port Sunlight 1888-1914. (Following the publication of Poverty: A study of Town Life by Seebohm Rowntree 1901)</td>
</tr>
<tr>
<td>1898</td>
<td>The Garden City Association.</td>
<td>Low densities 12-30 dwellings per acre.</td>
</tr>
<tr>
<td>1902</td>
<td>Letchworth Garden City</td>
<td>The first Garden City Based on very low densities of 12 dwellings per acre (See 1903 and 1907 Cheap Cottages Exhibitions)</td>
</tr>
<tr>
<td>1903</td>
<td>LCC Suburban Estate Totterdown Fields, Tooting, London</td>
<td>31 dwellings per acre in two storey terraced houses with gardens</td>
</tr>
</tbody>
</table>
Health and welfare are still the key issues in moves to improve the quality of housing

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1915</td>
<td>Rent Restrictions Act</td>
<td>To postpone the inevitable hardship and shortages caused by “credit restrictions, shortage of materials and the growing demands of total war brought house building to a standstill” Pawley, Martin p.21</td>
</tr>
<tr>
<td>1918</td>
<td>The Tudor Walters Report</td>
<td>Marks a shift in focus - specifically on housing standards. Key points are: Target life of 60 years. Wide fronted semi-detached houses. Low density - 12 houses per acre in town and 8 in the country Minimum areas: 885 sq.ft / 82.2 m2 for three-bedroom, (non-parlour) 1,055 sq.ft / 98 m2 (with parlour).</td>
</tr>
<tr>
<td>1919</td>
<td>First Ministry of Health</td>
<td>Responsible for housing legislation until 1951 (Ministry of Housing and Local Government set up)</td>
</tr>
<tr>
<td>1919</td>
<td>The Addison Act</td>
<td>Government financial support for Local Authority costs beyond a certain level for every house erected</td>
</tr>
<tr>
<td>1927</td>
<td>Housing Manual (and reprinted 1934)</td>
<td>On the design construction and repair of dwellings</td>
</tr>
<tr>
<td>1929</td>
<td>CIAM discuss the existenzminimum</td>
<td>Le Corbusier’s and Ginzburgs minimum spaces An architectural interest in the functional or rational dwelling.</td>
</tr>
</tbody>
</table>

The individual dwelling size and space standards are now considered alongside measurement of density in numbers of dwellings per acre

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1944</td>
<td>The Dudley Report and Housing Manual</td>
<td>Flats are included for the first time. Density - 24 dwellings per acre. Three storey houses are proposed to increase density in towns. Houses with scullery, living room and parlour are replaced by houses with kitchen and living / dining rooms. Minimum areas increased to 900-950 sq.ft / 83-88 m2 for a typical three-bedroom house. Refers to &quot;the housewife or consumer's view&quot;</td>
</tr>
<tr>
<td>1944</td>
<td>The Abercrombie Greater London Plan</td>
<td>Generally in favour of decentralisation</td>
</tr>
<tr>
<td>1946</td>
<td>New Towns Act</td>
<td>Development Corporations are set up</td>
</tr>
<tr>
<td>1949</td>
<td>Housing Manual</td>
<td>Questions uniform low-density. Proposes terraced housing and blocks of maisonettes in favour of the Tudor Walters semi-detached model. The 'Radburn' effect is evident in recommendations for separation of pedestrian and vehicular traffic.</td>
</tr>
<tr>
<td>1951</td>
<td>Ministry of Housing and Local Government (MHLG) established.</td>
<td>Typical house plans are issued to Local Authorities. For low density, estates - 18-25’ / 5.5-7.6m frontages. Heavily criticised for: lack of storage space; lack of a second WC in large homes; reduction in space of approx. 50 sq ft. / 4.6 m2 per house</td>
</tr>
<tr>
<td>1952</td>
<td>Harold McMillan’s peoples houses (MHLG)</td>
<td>Family flats at first floor level recommended as well as terraced houses with narrower - 16 foot frontages</td>
</tr>
<tr>
<td>Year</td>
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<tr>
<td>1953</td>
<td>Houses 1953 (MHLG) supplement to the Peoples Houses</td>
<td>“chief contribution towards further economies is the raising of densities” Lloyd, at Shelter, pointed out that Macmillan’s achievement (300,000 houses in 1953) was not without its drawbacks: “The slight fly in the ointment is that not all of them were the best houses. Some of the most shocking tower-block monstrosities were built in that era.” Macmillan sacrificed quality to quantity. His houses were smaller than those built by Nye Bevan, who during most of the post-war Labour government had been responsible for both health and housing. Macmillan was much more anxious to be seen as progressive than to worry about the aesthetics of what he was doing. <a href="http://www.conservativehome.com/thetorydiary/2013/10/how-macmillan-built-300000-houses-a-year.html">http://www.conservativehome.com/thetorydiary/2013/10/how-macmillan-built-300000-houses-a-year.html</a> Accessed 14.05.2016</td>
</tr>
<tr>
<td>1958</td>
<td>Flats and Houses 1958 (MHLG)</td>
<td>Increased densities on urban sites to up to 160 habitable rooms per acre</td>
</tr>
<tr>
<td>1961</td>
<td>Homes for Today and Tomorrow the Parker Morris report DoE HMSO, 1961</td>
<td>Intended as a recommendation for both private and public housing. It defined activities or functions rather than room areas. Five person, two storey terraced house 910 sq.ft / 84.5 m2 (+ 50 sq.ft / 4.6 m2 storage) Four person version 800sq.ft / 74 m2 (+ 50 sq.ft / 4.6 m2 storage)</td>
</tr>
<tr>
<td>1967</td>
<td>Parker Morris standards made mandatory for New Towns and all Local Authority housing</td>
<td>Minimum space standards were very quickly to become maximum.</td>
</tr>
<tr>
<td>1969</td>
<td>Housing Act</td>
<td>Local Authorities and Housing Associations can use capital grants for purchasing housing stock and its rehabilitation for a 30 year life.</td>
</tr>
<tr>
<td>1973</td>
<td>VAT replaces purchase tax</td>
<td>All construction and alteration work is zero rated.</td>
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<tr>
<td>1974</td>
<td>Housing Act</td>
<td>Improved on the 1969 Act and introduces a new grant system for rehabilitation with advisory standards for repair and improvement</td>
</tr>
<tr>
<td>1980</td>
<td>Housing Act</td>
<td>Margaret Thatcher’s government introduced the ‘Right to Buy’</td>
</tr>
<tr>
<td>1981</td>
<td>Parker Morris standards and the housing costs yardstick are abandoned.</td>
<td>With the idea to bring new and rehabilitated public housing more into line with the private sector. No minimum space standards except for single people, the disabled and the elderly.</td>
</tr>
<tr>
<td>1984</td>
<td>VAT</td>
<td>Only new construction is zero rated. (For repairs or alterations, only work to listed buildings is exempt)</td>
</tr>
</tbody>
</table>

Starting in the 1990s a whole series of different sets of regulations based on a range of factors – ageing population, disability legislation, energy efficiency, urban environments – added considerably to the complexity of the field.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
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<tbody>
<tr>
<td>1992</td>
<td>PPG3, updated 2000 and in force until 2006. Replaced by PPS3 in Nov 2006</td>
<td>To encourage higher density development particularly on ‘brownfield’ sites, in urban environments and to compel developers to include affordable homes</td>
</tr>
<tr>
<td>Year</td>
<td>Title</td>
<td>Description</td>
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<tr>
<td>1995</td>
<td>Lifetime Homes Standard (Age UK, TCPA and Habinteg Housing Association)</td>
<td>Revised in July 2010, From 2011 for all public sector projects. Now in building regs. An expression of Inclusive Design. &quot;Housing that is designed to the Lifetime Homes Standard will be convenient for most occupants, including some (but not all) wheelchair users and disabled visitors, without the necessity for substantial alterations.&quot; <a href="http://www.lifetimehomes.org.uk/pages/revised-design-criteria.html">http://www.lifetimehomes.org.uk/pages/revised-design-criteria.html</a></td>
</tr>
<tr>
<td>2000</td>
<td>Urban Design Compendium</td>
<td>By having an understanding of factors such as the history of the place, how it developed, the people who live there and how it functions developments can be more effectively and appropriately positioned. <a href="http://udc.homesandcommunities.co.uk/urban-design-compendium?page_id=3899&amp;page=44">http://udc.homesandcommunities.co.uk/urban-design-compendium?page_id=3899&amp;page=44</a>.</td>
</tr>
<tr>
<td>2001</td>
<td>Better Places to Live by Design: a companion guide to PPG3, DTLR and C Abe</td>
<td>&quot;...it draws together the principles of good urban design as they relate to the residential environment to help move the practice of good design forward. ... focuses on the attributes that underlie successful residential environments in order to provide guidance on implementing the new approach to planning for housing set out in Planning Policy Guidance 3: Housing (PPG3).&quot;</td>
</tr>
<tr>
<td>2003</td>
<td>Off-site Construction BRE</td>
<td>&quot;With millions of new homes needed in the UK, and an acute skills shortage, off-site construction has obvious benefits for the house building sector.&quot; <a href="http://www.bre.co.uk/news/Putting-the-case-for-offsite-construction-110.html">http://www.bre.co.uk/news/Putting-the-case-for-offsite-construction-110.html</a></td>
</tr>
<tr>
<td>2004</td>
<td>The home buyer’s guide: what to look for and ask for when buying a new home</td>
<td>Ale Ely, CABE, Black Dog Publishing. Encouraging an informed consumer perspective &quot;We all have to start demanding more, raising expectations and coercing builders into building homes that suit our needs. What we want are well-designed, carefully planned and expertly delivered homes with an after care service better that the best car dealers&quot;</td>
</tr>
<tr>
<td>2004</td>
<td>Housing Futures 2024, A provocative look at future trends in housing</td>
<td>RIBA CABE, John Worthington. opening up the debate about possible futures, through the RBA think tank Building Futures and ongoing publication in building Magazine. &quot;Housing in the future needs to be more adaptable and responsive to change.&quot;</td>
</tr>
<tr>
<td>2009</td>
<td>Space in New Homes Design Council RIBA Ipsos Mori postal survey</td>
<td>Supports the case for more space in private homes, to ensure that they are functional, flexible and fit for purpose. &quot;The market does not appear to provide the space that residents require&quot;</td>
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<tr>
<td>2010</td>
<td>London Housing Design Guide Interim Edition Mayor of London LDA</td>
<td>“At the core of the guide are new minimum space standards”. Minor concession to flexibility “Dwelling plans should demonstrate that dwelling types provide flexibility by allowing for alternative seating arrangements in living rooms and by accommodating double or twin beds in at least one double bedroom.”</td>
</tr>
<tr>
<td>2011</td>
<td>The Case for Space the size of England’s Homes RIBA (The Homewise Campaign)</td>
<td>Surveys of current provision. Plans to show what the missing spaces could mean in standard homes.</td>
</tr>
<tr>
<td>2012</td>
<td>The Way we Live Now RIBA Homewise Ipsos Mori</td>
<td>A very limited ethnographic survey based on questionnaires looking at decision making process for people thinking of buying a new home</td>
</tr>
<tr>
<td>2012</td>
<td>Building for Life. Delivering great places to live. CABE and the Home Builders Federation (HBF)</td>
<td>Supported by government as the “standard for the design quality of new homes. It includes a question on flexibility “Do internal spaces and layout allow for adaptation, conversion or extension?</td>
</tr>
<tr>
<td>2013</td>
<td>Government expanded permitted development rights – to boost the provision of new homes - to allow the conversion of office buildings into housing. Made permanent in 2015.</td>
<td>Conversions are not required to meet space standards, or any other planning-based quality standards such as energy efficiency, disability nor affordability.</td>
</tr>
<tr>
<td>2014</td>
<td>Home Truths London First Housing Task Force Data from GLA and LSE <a href="http://londonfirst.co.uk/wp-content/uploads/2014/03/LF_HOUSING_REPORT.pdf">http://londonfirst.co.uk/wp-content/uploads/2014/03/LF_HOUSING_REPORT.pdf</a></td>
<td>One of their recommendations “Boroughs could use their compulsory purchase powers to bring land back to the market, where: a reasonable period of time from the permission being granted – say five years – has elapsed; and after consultation with the landowner and/or developer, they are satisfied there are no credible plans to develop in the medium term; and where it is in the public interest that it be brought forward.”</td>
</tr>
<tr>
<td>2015</td>
<td>Homewise: Space Standards for Homes RIBA</td>
<td>RIBA call for the reintroduction of minimum space standards 385p house 93m2 &quot;We’re calling for minimum space standards to apply to all homes, in every location. We’re asking the government to create a fair housing offer by embedding the Nationally Described Space Standard in building regulations.”</td>
</tr>
<tr>
<td>2015</td>
<td>Technical Housing Standards - nationally described space standard DCLG <a href="https://www.gov.uk/government/publications/technical-housing-standards-nationally-described-space-standard">https://www.gov.uk/government/publications/technical-housing-standards-nationally-described-space-standard</a></td>
<td>One bed one person flat = 37 m2 Three bed five person home = 93m2 “This new standard was supposed to improve the quality of new-build housing by ensuring they are built to an adequate size. In October 2015, new rules were introduced giving Local Authorities the option to set a minimum space standard for new homes. The rules were</td>
</tr>
<tr>
<td>Year</td>
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<td>Details</td>
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</tbody>
</table>
| 2015 | Building for Life 12 3rd edition | Not applicable to student housing, office conversions...
|      | CABE at Design Council, Design for Homes, HBF, Nottingham Trent University. Based on National Planning Policy Framework | introduced to rationalise, simplify and streamline the planning system, but the process to set the new standard is overly complicated and onerous. Crucially, the space standard is optional” housing.org.uk |
| 2015 | GLA Housing Standards Review: Evidence of Need Final Report | No questions on the qualities of the home itself. “BfL 12 is very clearly focused on promoting quality in urban design for new residential developments. In the absence of national space standards for new homes, experience suggested that the questions relating to the internal qualities of the home were largely ineffective and proved difficult to apply.” |
| 2015 | Building Regulations | It demonstrates a clear need for the inclusion of housing standards within the London Plan. They are a necessary and appropriate mechanism to ensure that housing is sustainable and of high quality whilst offering the space and flexibility required to accommodate the demands of a rapidly growing and ageing population in a high density city facing distinct climate challenges. |
| 2016 | Housing and Planning Bill 2015-16 Part 4 Social Housing in England, Chap. 1 Implementing the right to buy on a voluntary basis Chap 2 Vacant High Value Local Authority Housing Chap. 3 Rents for High Income Social Tenants Chap. 6 Secure Tenancies | Currently in process. Includes controversial aspects such as the 'phasing out of tenancies for life', 'Power to change rents', 'Duty to consider selling vacant high value housing' and 'policies for high income social tenants'

Following agreement by both Houses on the text of the Bill it received Royal Assent on 12 May. The Bill is now an Act of Parliament (law). http://services.parliament.uk/bills/2015-16/housingandplanning.html

All websites accessed 14.05.2016

With thanks to David Levitt’s excellent article Housing Standards: Standards past – and future? AJ November 1982 pp.77-89
Figure 1 Typical page from Modern Flats, 1958
Unite d’Habitation, Marseilles, Le Corbusier, 1952

Plans and sections at different scales to show the two main apartment types with the split-level section.
Figure 2 Typical page from Modern Housing Prototypes 1978
Unite d’Habitation, Marseilles, 1945-52  Le Corbusier

Colour coded cutaway axonometric drawn for the publication
Figure 3 Typical part page from the Floor Plan Manual Housing 1994
Unite d’Habitation, Marseilles, 1946-47 Le Corbusier

Plans to show how the basic type can be varied.
Figure 4 Nagakin Capsule Tower, Tokyo, Japan 1972
Kisho Kurakawa

Level 6 floor plan
Figure 5 High Cross Road, London 2001  
Walter Menteth Architects

Single-person terraces houses 47.5m2 with living room on the ground floor and bedroom on the first floor.
Figure 6 Narkomfin, Moscow, 1930
Mosie Ginzburg and Ignati Milinis

Typical, minimal size, split-level apartments with double height living spaces
Figure 7 Main block, Weissenhof Estate 1927
Ludwig Mies van der Rohe 1886-1969

Flexible planning includes limited internal structural elements, varied layouts and sliding partitions to allow alterations to plans.
Figure 8 Terraced Housing, Vienna Werkbund Housing Exhibition 1932
Andre Lurcat 1894-1970

The inclusion of folding beds is to allow the redundant bedspaces to be used during daylight. Note also wide frontage, option to extend at roof level and indeterminate buffer zone at ground level.
Time and place of activities

Fig. 2. The older family
(Parents (mother working part-time) and boy aged 23, girl 20, boy 14)

0700
With 4 workers and a secondary school child wanting to wash before they leave home, a second W.C. and wash basin is needed. Hot water and warmth are again essential.

0730
There is a crush in and around the kitchen. Sandwiches are being cut, lunches packed up, breakfast eaten, before all collect their things and leave home.

0830
While the house is empty during the day, the bread, milk, parcels and perhaps laundry will have to be delivered and put in safe places, and the meter reader may call.

1630
When the wife gets back from work she wants to be able to warm the house, clear up and get a snack with as much speed and as little trouble as possible.

1830
The evening meal may be the only time during the week when the family sit down together. They may like to eat away from the kitchen area.

2000
In a practically adult family several individual activities may take place in an evening at home and room is needed for these.

2100
The family will sometimes split up into groups, during an evening and the children may entertain their own friends separately. Room and privacy are needed for more than one group.

2230
Before going to bed, people at work often have to get things ready for the morning and meanwhile perhaps have a snack. Room is needed for several people to do their chores at once.

2330
Separate bedrooms are needed by each child when reaching adolescence, but they do not need to be near the parents.

Figure 9 Space in the Home

Activities are the focus of the 'brief' rather than space standards.
Figure 10 Hong Kong Housing Authority Typical Slab Block Plan
From Patterns of Living, 2013
Street view

![Typical floor plan](image)

Figure 11 Dwellings for Young People, Leipzig, Germany 2000
HPP Hentrich-Petschnigg & Partners

The absence of any internal structural elements, and the modular arrangement of the façade is part of the strategy to allow for different internal partition configurations.
Figure 12 Yerba Buena Lofts, San Francisco, USA 2002
Stanley Saitowitz Natoma Architects, Inc.

Open plan 'indeterminate spaces' with double height to allow daylight into the long narrow plans
Figure 13 Estradenhaus, Berlin, Germany 1998 and 2001 popp.planungen.

The platforms at both ends can be used for seating, as a sleeping space or as a logia or balcony area. Between the raised platforms 12 full height panels approx. 1 metre wide can be adjusted to reconfigure the space.
Figure 14 Schlesischenstrasse Housing, Berlin Germany, 1994
Leon Wohlhage Wernik Architekten

The building is planned as a series of zones within which there is little differentiation in room sizes and rooms can be easily separated or thrown together with wide sliding doors / partitions
Plan of typical flats

Figure 15 Consort Road Housing, London, 2007
Walter Menteth Architects

Sliding partitions and wintergardens allow residents to alter the interior spaces
Figure 16 Bakkedraget Housing, Fredensborg, Denmark, 1963
Jorn Utzon 1918-2008

Courtyard housing focused on external space that can be used in different ways
Figure 17 Donnybrook Quarter, London 2006
Peter Barber Architects

A reinterpretation of the terraced house that gives each dwelling an outside space and the opportunity to extend their home.
Section through 3 Bed house

First floor with roof terrace only

Ground Floor

Figure 18 Quinta da Malaguiera Housing Evora, Portugal, 1977
Alvaro Siza 1933-

Based on 'back-to-back' housing with different options for later extension at roof level
Figure 19 Condensed Housing Development, Berlin, Germany 1999
Leon Wohlhage Wernik Architekten

A basic two storey unit can be extended to form a three-storey unit in one of two ways. Either a staircase continues to a full width room and terrace - which can also be extended later - or in paired units an external stair between the two gives independent access to additional space for a lodger or nanny.
Figure 20 Silodam, Amsterdam, The Netherlands, 2002
MVRDV

Each group of different flat types is an identifiable ‘mini neighbourhood’, on the exterior of the building via the different colours and textures of a variety of materials of construction.
Figure 21 Rue des Suisses, Paris, France, 2000
Herzog & de Meuron

Louvred facades of the infill block on rue des Suisses